Source Water Assessment Program (SWAP) Report For Sacred Heart Elementary School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

? Inventory land uses within the recharge areas of all public water supply sources;

? Assess the susceptibility of drinking water sources to contamination from these land uses; and

? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared:
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Table 1: Public Water System (PWS) Information

PWS NAME	Sacred Heart Elementary School
PWS Address	329 Bishops Highway-Rte. 80
City/Town	Kingston, Massachusetts
PWS ID Number	4145003
Local Contact	Ron Maurice, Certified Operator
Phone Number	781 585-2114

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well #1	4145003-01G	153	450	High
Well #2	4145003-02G	153	450	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Sacred Heart Elementary School is a public water supply currently serving 450 elementary students and an on-site convent. Well #1 and Well #2 are located in a vault adjacent to the southeast corner of the school building. The two (2) wells are manifolded and operate on an alternating basis. Well #1 is an 8-inch 90-foot deep well and Well #2 is believed to have been completed at the same depth. Based on the current Zone I of 153 feet and the Interim Wellhead Protection Area (IWPA) of 450 feet, the average daily withdrawal for the well is limited to 2257 gallons per day. The Zone I and IWPA protective radii are based on metered water readings. Please refer to the attached map of Zone I and IWPA. Well #1 is located in a sand and gravel aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminate migration. A diesel-powered generator provides emergency

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by **the** water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

power.

Both wells serving Sacred Heart Elementary School are treated for corrosion control with a treatment system that consists of multimedia filters and two (2) acid neutralization units. An irrigation well for the athletic fields is located in the southwest corner of the soccer field. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activi ties in Zone Is,**
2. **Underground Storage Tank (UST) in IWPA,**
3. **Athletic Fields,**
4. **Floor Drain,**
5. **Septic System.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the Zone I, as seen in Table 2.

1. **Zone Is –** Currently, the wells do not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The Zone I for both wells contains school buildings, pavement, lawn areas, catch basins and an aboveground storage tank containing diesel fuel that has 110 percent containment. The School does not use fertilizer or pesticides in the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. Examples of modification or expansion include the addition of buildings, temporary or permanent, and increased water use due to an increase of staff and students.

   Recommendations:

- To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- If the school intends to continue using the structures, driveways, and paved areas in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Underground Storage Tank	No	Well #1, #2	High	7600 gallon heating fuel tank, no secondary containment, or leak detection
Floor Drain	No	Well #1, #2	High	Basement boiler room
Aboveground Storage Tank	No	Well #1, #2	Moderate	Diesel fuel tank with secondary containment
Hazardous Material/Waste Oil storage, handling and use	No	Well #1	Moderate	Waste oil and small amounts of chemical storage
Athletic Fields and landscaped areas	Well #1, #2	Well #1, #2	Moderate	
Pavement (storm water runoff)	Well #1, #2	Well #1, #2	Moderate	Provide drainage away from the wells
Septic System	No	Well #1	Low	Refer to attachment on septic systems

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- During the SWAP assessment visit, the Department recommended that the UST for the diesel fuel be removed.

Recommendation implemented:
Subsequently, the certified operator indicated that the underground storage tank for the diesel generator had been removed and replaced with an aboveground storage tank with 110 percent secondary containment.

2. **Underground Storage Tank -** Within the IWPA, a 7600-gallon UST containing heating fuel is located approximately 210 feet west of both wells. According to school staff the tank is believed to been installed over 30 years ago. The UST has overfill protection and undergoes tightness testing periodically. If managed improperly, USTs can be potential sources of contamination due to leaks or spills of the chemicals they store. According to 527 CMR 9.00 storage tanks that do not have an acceptable form of leak protection or cathodic protection shall have the tank tested at the owners expense.

Recommendation:

- Consult with the local fire department for specific code requirements regarding your USTs. Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements.
- For consumptive fuel USTs in the IWPA, the Drinking water program recommends the following hierarchy:
    I. If feasible, upgrade to propane or natural gas and remove UST.
    II. Replace UST with an aboveground storage tank (AST) in the IWPA with 110% secondary containment.
    III. Replace UST with a new UST meeting all current regulatory requirements (e.g. double walled, leak protection etc.) in the IWPA.

Recommendation to be implemented: The certified operator indicated that the heating fuel UST would be removed and replaced with an AST with secondary containment within the next year.

3. **Athletic Fields -** There are athletic fields located within the IWPA of Well #1 and Well #2. Over-application of pesticides and fertilizers on athletic fields is a potential source of contaminants to the water supply. Currently, the school does not use fertilizer or pesticides on the athletic fields.

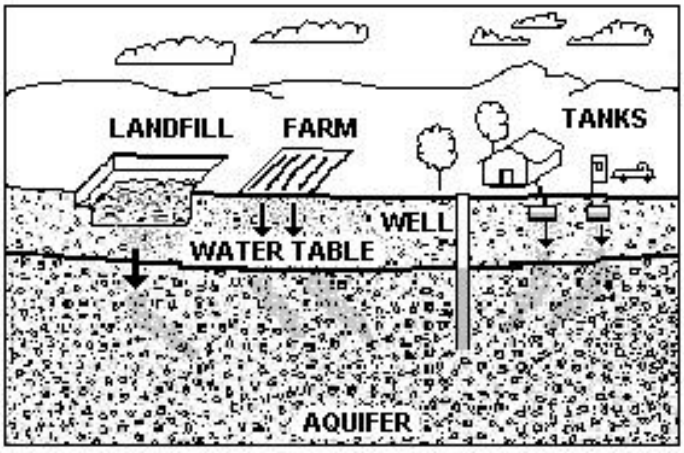

Figure 1: Example of how a well could become contaminated by different land uses and activities.

Recommendations:

- If the school decides to use fertilizer or pesticides use BMPs for applying, handling and storing.
- Refer to attachments, "Protecting Water Sources from Fertilizer" and, "Protecting Groundwater from Pesticides".

4. **Floor Drain -** A floor drain was observed within the basement boiler room. The boiler treatment chemicals have been removed from the boiler room. The backwash from the corrosion control treatment system discharges to the septic system. Additionally, there is a sump pump located in the basement to prevent flooding.

Recommendation:

- Backwash of water treatment devices to a septic system regulated under 310 CMR 15.000 is prohibited. Contact your local Board of Health for additional information regarding your requirements under 310 CMR 15. 000.
- Industrial Wastewater- Discharge from the boiler blow

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946 - 2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

down is required to go to a tight tank or sewer. Please contact Jeff Gould in the Department's Water Pollution Control section at 508-946-2757 in order to discuss your management options.

5. **Septic System** - The septic system leaching field is located approximately 300 feet west of both wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

Recommendations:

- V Staff should be instructed on the proper disposal of spent household chemicals (include custodial staff, groundskeepers, and certified operator).
- V Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

Other activities noted during the assessment

A garage is located within the western portion of the IWPA. The garage contained gasoline containers, fertilizer and pesticides and other small amounts of petroleum products, cleaners etc. The oil/hazardous material storage poses a potential threat to the well due to its proximity and potential for accidental release. Provide containment and exercise caution when using and storing these products. Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html. Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, and certified operator. Post labels as appropriate on raw materials and hazardous waste.

Storm water for the western parking lot is routed by catch basins and overland flow to a retention basin, which is inside the IWPA, approximately 425 feet west of the wells. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Sacred Heart Elementary School is commended for its removal of the UST for the diesel generator. Sacred Heart Elementary School should review and adopt the **key recommendations above** and the following:

Zone I:

- V Keep non-water supply activities out of the Zone I.
- V Consider well relocation if Zone I threats cannot be mitigated.
- V Well #1 and Well #2 are vault/pit installation. Pit installations for water supply wells are not approved by the Department due to the safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect sanitary quality of the water being delivered. Consider extending the Wellhead to 18 inches above the final grade of the surface as part of future modifications to both wells.

Training and Education:

- Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- Work with your community to ensure that stormwater runoff from local roads is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.

Planning:

- Work with local officials in Kingston to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4 Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide and Fertilizer Use Fact sheets
- Healthy Schools Fact Sheets
- Heating Oil Delivery Lines, A Homeowner's Guide to Preventing Leaks
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form